DOCUMENT RESUME

ED 108 178 CS 001 968

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TITLE Types of Word Recognition Errors Made by Second and Fifth Grade Students.
PUB DATE [74]
NOTE 31p.

EDRS PRICE MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS Elementary Education; Grade 2; Grade 5; *Oral Reading; Phonics; *Reading Instruction; *Reading Research; Semantics; Syntax; *Word Recognition; *Word Study Skills

ABSTRACT

The purpose of this study was to determine if differences existed between second- and fifth-grade students' word recognition errors, and if differences existed between the word attack strategies utilized by them. Using the Informal Reading Inventory, a random sample of twenty-five second graders and twenty-five fifth graders was taken from three middle-class metropolitan schools. The types of word recognition errors were classified according to criteria the researcher had established and then converted into proportions. Differences between the second- and fifth-grade subjects' errors were tested at the .01 level using the z test. The results indicated that second and fifth graders made similar types of word recognition errors during oral reading, with the following exceptions: (1) second graders had more words given by the examiner, (2) fifth graders confused the initial consonant more frequently, and (3) fifth graders made more meaningless guesses. Both groups tended to use initial clues combined with syntax and semantics as a primary aid to word recognition. (Author/LL)

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CS 001 968

TYPES OF WORD RECOGNITION ERRORS
MADE BY SECOND AND FIFTH GRADE STUDENTS

ABSTRACT

Although some research has dealt with the types of word recognition errors made by children, it has been largely confined to first grade youngsters.

The purpose of this study was to determine if differences existed between second and fifth grade students' word recognition errors, and if differences existed between the work attack strategies utilized by them.

The testing instrument used was an Informal Reading Inventory developed by the researcher and containing levels of readability from primer through the ninth grade. Comprehension questions were of three types -- literal, inferential, and critical evaluation. A pilot study was conducted to establish a coefficient of stability for word recognition and validity for the comprehension questions.

A random sample of twenty-five second and twenty-five fifth graders was taken from three middle-class metropolitan schools to whom the Informal Reading Inventory was administered by the researcher and two trained examiners.

The types of word recognition errors were classified according to criteria the researcher had established and then converted into proportions. Differences between the second and fifth grade subjects' errors were tested at the .01 level using the z test.

Generally speaking, second and fifth graders made similar types of word recognition errors during oral reading. However, there were exceptions such as (1) second graders had more words given by the examiner, (2) fifth graders confused the initial consonant more frequently, and (3) fifth graders made more meaningless errors. Further findings regarding strategies of word attack and use of syntax and semantics are discussed.

Both groups tended to use initial clues combined with syntax and semantics as a primary aid to word recognition.

Implications and teaching strategies for the classroom teacher are discussed and suggestions for further research given.

TYPES OF WORD RECOGNITION ERRORS MADE BY SECOND AND FIFTH GRADE STUDENTS

The Problem

Word recognition skills and particularly phonics has been a debatable issue since the early 1900's. One could almost trace the history of the teaching of reading in this country by following the role that phonics and other word recognition skills have played in the teaching of reading. The problem has reached the point where it is almost a journalistic issue. Authorities, depending upon their biases, cite research to support their position which may vary from advocating a very strong synthetic phonics approach to advocating an analytic phonics approach. At this time there does not appear to be any authority who advocates the elimination of phonics instruction.

Thus far, the research dealing with phonics could be summarized by stating that the findings of experimental studies suggest that programs emphasizing synthetic phonics tend to produce students who can pronounce words better but may not comprehend as well as students subjected to a reading program that does not stress synthetic phonics. However, these findings should not be viewed as being detrimental to synthetic phonics, but rather they may suggest that teachers who stress phonics tend to ignore the teaching of comprehension skills, and as a result, the students are not as skillful in deriving meaning from what they read. Such a situation could possibly be overcome if teachers would place equal stress upon both phonics and comprehension.

Although phonics is an important word recognition skill, it is only one of five basic word analysis skills -- the others being visual clues (configuration), context clues, tructural analysis, and dictionary usage. These skills all have a place in a good reading program, but their significance should be kept in proper perspective. They are a means to an end, and the end is that the child will be able to analyze a word frequently enough so that the word eventually becomes a sight word.

Just which of the word analysis skills is the most important or is a combination of the skills more useful is still a debatable issue. What word attack strategies do children use in reading and how these strategies change as the child acquires reading ability are still unanswered by the present research.

One method of investigating word attack strategies is to study the types of word recognition errors children make in oral reading. This type of research has become of more interest to reading authorities since the late 1950s . The majority of the research in this area has been conducted at the first grade level, and the researchers have attempted to identify the progressive change in word recognition strategies that were developed by children as they learned to read. Dr. Jeanne Chall stated in a review of these studies, "The implications of these kind of error data for understanding the beginning reading process and for the diagnosis and teaching based on individual needs are enormous"[3, pp. 565-566].

It was with that thought in mind that the present study was pursued. Findings regarding the most common types of word recognition errors committed by second and fifth grade students during oral reading

might provide the classroom teacher with information with which to plan a more successful developmental reading program. It would possibly provide some insight into word recognition strategy utilized by second and fifth grade students; and if there is a difference between the two, it would provide educators with additional insight into how children learn to read.

Review of the Literature

A comparatively recent study conducted by Weber was reported in Chall's article[7, pp. 563-564]. She summarized past research on oral reading errors and reported that in all of the research that she (Weber) investigated the interest was in words as visual displays rather than written words considered as linguistic units represented graphically. In the discussion of word recognition errors, very little consideration was given to the reader's knowledge of the grammatical structure of his language during reading.

Weber's own study of the errors made by twenty-one first graders who were taught with a regular basal reading program (Scott-Foresman) considered several linguistic levels:

1. The words match with the stimulus as a graphic display.
2. Its morphological structure relative to that of the stimulus.
3. Its syntatic function in a phrase as indicated by its part of speech.
4. Its syntatic acceptability in the sentence.
5. Its semantic appropriateness to the meaning of the entire passage.

Full stops (non-recognitions), hesitations and repetitions were not counted as errors.

Weber discovered that substitution of one word for another comprised eighty percent of the total reading errors made by her sample of first graders. Omissions and insertions constituted ten percent, and reversals and scrambles of words made up less than three percent.

When substitution errors were classified on an index of graphic similarity such as identical letters, position of identical letters, and length, she found that the more capable readers had a higher index of graphic similarity than the less capable readers. In a comparison of errors over a period of time, both the high and low groups showed an increase in the degree to which their word recognition substitutions were similar to the stimulus words.

In a comparison between the grammatical correctness of the substitution, ninety-one percent of the substitutions were judged to be grammatically correct with the preceeding context, and sixty-four percent were judged to be grammatically correct in terms of the entire sentence.

For sentences that remained grammatically correct with the substitution, ninety-three percent were found semantically appropriate up to the point of the error, and sixty-eight percent semantically appropriate in terms of the entire selection.

Weber also discovered an interaction between the use of graphic clues and contextual clues (syntactical and semantic). The higher the graphic similarity of the error, the lower its contextual appropriateness. Also, grammatical acceptability and semantic

appropriateness tended to decrease with time, suggesting the increasing ability of the children to respond to the words in terms of sound-letter correspondence.

Weber concluded the following concerning strategies used by first graders:

> This analysis of errors of the syntactic and semantic analysis of errors on the semantic levels suggest that even early readers can successfully make use of preceeding verbal context; it is clear that they do not depend solely on graphic representation to make a response. Reading instruction might well incorporate guidance on the optimal balance in use of correspondences between sounds and letters and the expectations transferred from verbal experience. However, this description leaves us far from discerning what the optimal balance might be [7, p. 64].

Another study reported by Chall and conducted by Biemiller was similar to Weber's in that it was a study of oral reading errors made by first graders who also learned to read in a basal reader program. However, he counted non-recognitions as errors [2, pp. 564-565].

Biemiller's study indicated that his first graders tended to make a progression in the types of errors made at the beginning and the end of first grade. He divided these into three major phases. The first phase was characterized by a preponderance of substitution errors that suggest a heavy reliance upon context. The second phase was characterized by the majority of the errors being non-responses. The third phase was characterized by greater flexibility in strategies used to identify words.

His findings indicated that some children remained at the first phase all year long and these children were the poorest readers at the end of the year. The better readers reached the second phase earlier and continued on to the third phase at a much more rapid pace.

Although both Weber's and Biemiller's studies are helpful in our understanding of how children read, further research is needed.

The present study was initiated in order to discover the answers to the following questions:

1. What are the types of word recognition errors most commonly made by second grade students while reading materials at different levels of readability?
2. What are the types of word recognition errors most commonly made by fifth grade students while reading materials at different levels of readability?
3. Is there a difference in the type of word recognition errors made by second and fifth grade students?
4. What strategies of word attack do second and fifth graders use and is there a difference between them?

Procedures of the Study

The Population

The population used for the study contained all of the second and fifth grade students in three middle class elementary schools. Those grades were chosen to permit a comparison between primary and intermediate grade children.

For the most part the pupils came from average middle-class homes. The greatest percentage was Anglo (89%); however, there was a comparatively large percentage of Mexican-Americans (8%) and a very small percentage of Negroes (1%), Chinese (<1%) and Papago Indians (1%).

As a part of the school district-wide testing program, all students in the elementary schools were given the Stanford Achievement test during the month of March. The S,R.A. Primary Mental Abilities Test was also administered to first, third, and fifth graders. Table I gives the mean scores achieved by the population on each of these tests. The I.Q. mean score for the second grade was computed from test scores taken during the first year in school.

Table I Description of Population: Sex, Mean C.A., Mean I.Q., Range and Mean Scores for Stanford Achievement Test

Grade	No.	Sex		$\bar{X}$	$\bar{X}$	Wd Mean.		Par Mean.		Wd St Skills	
		B	G	C.A.	I.Q.	Mean	Range	Mean	Range	Mean	Range
2	253	127	126	7-10	106	2.6	1.2-6.9	2.5	1.2-6.9	3.0	1.1-7.5
5	302	151	151	11-0	106	5.4	1.7-9.5	5.4	1.5-11.2	-	-

These findings suggested that the population of second and fifth grade students was comparatively evenly divided between boys and girls, and they did for the most part fall into the average range of intelligence.

When comparing the population of second graders to others of their own age, their mean score for word meaning was 2.6 which was exactly as it should have been for the time of year the test was taken. The mean score for paragraph meaning was one month below and the mean score for word study skills was four months above the grade norm.

These findings suggested that the second grade populations reading ability was basically average.

When comparing the population of fifth graders to others their own age, the mean score of 5.4 for word meaning and paragraph meaning was somewhat below the expected grade norm of 5.6. However, the difference was not great enough to suggest that they were experiencing extreme difficulty in reading.

Types of Reading Programs

Although the population for the study drew from three different schools, including nine second grade teachers and ten fifth grade teachers, the reading programs were somewhat similar. The basic program was centered around a Basal Reader approach which was combined with a Language Experience approach at the first grade level. The latter approach was only continued at the second grade level with students who had difficulty in making normal progress. Fifth grade students had been subjected to several basal reader series none of which had been used continuously over a period of years. Teachers had followed the program as outlined in the teacher's manual only when they had felt it necessary. Second grade students had been subjected primarily to one basal series, but others had been used as supplementary material. There was seemingly more continuity and coordination in the second graders' reading program.

Samples

The samples for the study were composed of twenty-five second and twenty-five fifth grade students randomly chosen from the entire second and fifth grade populations of the three schools. The students used in the pilot study were not included in the sampling.

The Testing Instrument

An Informal Reading Inventory (I.R.I.) was developed by the investigator containing an oral and silent reading selection for the readability levels of primer through ninth grade. These selections were carefully selected for the familiarity the students would have with the concepts and for level of readability. The Spache[6] and Dale-Chall[4] formulas were used to establish readability of the passages. Comprehension questions of literal recall, inference, and evaluation were composed for each selection. Barrett's taxonomy was used to define the different types of questions[1, pp. 19-23]. The I.R.I. was then evaluated by two judges both of whom had extensive background in the field of reading. The evaluation was designed to examine the suitability of the selections (interest and familiar concepts) and the comprehension questions. All suggested revisions were made, and the I.R.I. was administered to five second and five fifth grade students chosen at random from the population. The purpose of the pilot study was to establish a coefficient of reliability and to determine if the selections and questions were appropriate. After three weeks, the I.R.I. was again administered to the same subjects. The coefficient of reliability for the two testings were .943 for word recognition

and .990 for comprehension. It was also concluded that the selections were generally of interest and the concepts were familiar to the majority of the subjects. Any question not answered correctly by at least one subject was considered unsuitable. There were several questions that did not meet this criterion and some seemed ambiguous in their wording. Each of the doubtful questions was examined by the judges and the researcher and all necessary changes were made.

Administration and Scoring of the I.R.I.

In order to shorten the time needed to gather the research data and to eliminate researcher bias, two other examiners with extensive background in reading were trained and utilized in the administration of the Informal Reading Inventory. The subjects were randomly assigned to the examiners, and the administration of the I.R.I. was made as uniformly as possible. All subjects began with a practice selection at the primer level to make certain they knew what was expected of them. Actual, testing began at the primer level of readability and continued until the subject had two consecutive levels where either his word recognition was eighty-five percent or less, or his comprehension was fifty percent or less. This provided a healthy psychological situation for the subjects and still provided the necessary information sought by the researcher.

The word recognition percentage was computed from the oral selection. Mispronounced words, omitted words, inserted words, words that were reversed such as be to for to be, and words provided by the examiner after a ten second delay were considered word recognition errors.

However, any of these five types of errors that were corrected by the subject and mispronounced words that were considered to be a result of the subject's dialect were not scored s errors.

The comprehension score was computed from the silent reading selection and all questions were assigned equal weight. Partial answers were scored according to the amount of correctness. For example, if the question required an answer containing two parts and the subject only gave one, the question was scored as being half correct.

In order to make certain the scoring was uniform, all tests were scored by all three examiners and questionable scoring was resolved.

The Hypotheses for the Study

The following research hypotheses were tested:

1. The types of word recognition errors made by second graders will differ from those made by fifth graders.
2. Fifth graders' word recognition substitutions will tend to fit the syntax and/or semantics of the sentence more often than those substitutions made by second graders.

Data Analysis and Findings

Analysis Procedures

In order to analyze the types of word recognition errors made by the second and fifth grade subjects, it was necessary to develop the following criteria for word recognition errors:

1. Words Given by the Examiner are words which the subject hesitated over for a period of ten seconds and was given

to the subject by the examiner or words asked for by the subject.

2. Insertions are words read into the selection that were not a part of it.
3. Omissions are words that were omitted by the subject as he read orally.
4. Reversed Word Sequence is the reversal of word sequence such as be to for to be.
5. Reversed Letters are the reversals of letters such as b and d that result in a mispronounced word.
6. Reversed Words are reversals of words such as was for saw that results in a mispronounced word.
7. Overdependence on Configuration is the substitution of one word for another, and the substituted word resembles the correct word in configuration such as bad for lot.
8. Overdependence on Initial Clues is the substitution of one word for another, and the substituted word has the same initial letter as the correct word but differs in other ways such as same for Susan.
9. Overdependence on Final Clues is the substitution of one word for another, and the substituted word has the same final consonant letter as the correct word but differs in other ways such as sit for get.
10. Confusion of Initial Consonants is the substitution of one word for another, and the substituted word is the same as

the correct word except for the initial consonant letter such as bent for went or dried for tied.

11. Confusion of Final Consonants is the substitution of one word for another, and the substituted word is the same as the correct word except for the final consonant letter such as bad for bat.

12. Confusion of Inflectional Endings is the substitution of one word for another, and the substituted word is the same as the correct word except for the inflectional ending such as calls for called or call for calls.

13. Confusion of Consonant Clusters (Blends) is the substitution of one word for another, and the substituted word is similar to the correct word except for the initial or medial cluster such as cluck for truck or his for this.

14. Confusion of Hard or Soft c is the substitution of one word for another, and the substituted word is pronounced in a way that indicates a confusion of the hard and soft sound of c such as cent for cat.

15. Confusion of Hard and Soft g is the substitution of one word for another, and the substituted word is pronounced in a way that indicates a confusion of the hard and soft sound of g such as get for jet.

16. Confusion of Short Vowels is the substitution of one word for another, and the substituted word is the same as the correct word except for the short vowel such as want for went.

17. Nonrecognition of Final e is the substitution of one word for another, and the substituted word is mispronounced with a short medial vowel rather than a long vowel that is the result of the final e such as kit for kite.

18. Nonrecognition of Diphthongs is the substitution of one word for another, and the substituted word is mispronounced because of the use of the incorrect diphthong or vowel such as bit for boil.

19. Nonrecognition of Vowel Diagraphs is the substitution of one word for another, and the substituted word is mispronounced because of the use of an incorrect diagraph such as got for goat.

20. Nonrecognition or Confusion of r Controlled Vowels or Vocalic rs is the substitution of one word for another, and the substituted word is pronounced in a manner that suggests either a confusion of or nonrecognition of r controlled vowels or the vocalic r such as car for care or bid for bird.

21. Meaningful Guesses is a word substituted for the correct word that seems to be a guess by the subject but fits the syntactical and semantic pattern of the sentence such as went for gone.

22. Meaningless Guesses is a word substituted for the correct word that seems to be a guess by the subject and does not fit the syntactic and semantic pattern of the sentence such as store for meadow.

The results of the scores for word recognition and comprehension for both second graders and fifth graders are contained in Table II and Table III.

Table II Range, Median, and Mean Scores of Word Recognition and Comprehension for Second Grade Subjects Based on Results From an I.R.I.

Level	N	W.R.Rng.	Comp.Rng.	W.R.M.	Comp.M.	W.R.$\bar{X}$	Comp.$\bar{X}$
P	25	88-100	30-100	98.5	61.4	97.7	75.2
1	25	64-100	10-80	93.3	31.4	92.3	44.4
2	25	34-100	0-80	93.8	31.3	83.5	38.6
3	14	82-100	15-70	96.5	40.5	95.9	39.3
4	8	93-100	0-65	95.5	31.5	96.9	46.9
5	6	88-98	20-60	89.5	40.5	94.5	39.2
6	4	92-98	20-55	96.5	30.5	95.6	35.0

Table III Range, Median, and Mean Scores of Word Recognition and Comprehension for Fifth Grade Subjects Based on Results from an I.R.I.

Level	N	W.R.Rng.	Comp.Rng.	W.R.M.	Comp.M.	W.R.$\bar{X}$	Comp.$\bar{X}$
P	25	94-100	30-100	96.9	71.3	99.1	78.4
1	24	78-100	10-90	99.6	31.4	98.1	48.8
2	24	68-100	30-100	98.2	60.5	97.6	60.4
3	21	94-100	30-100	98.6	60.9	98.0	61.7
4	20	95-100	20-100	99.2	60.8	98.9	65.0
5	25	25-100	0-90	96.2	45.7	92.3	46.4
6	15	84-100	25-95	96.3	65.7	95.2	64.3
7	13	94-100	25-100	97.7	51.0	97.6	57.7
8	12	93-100	25-65	97.5	45.0	97.3	46.7
9	10	86-99	10-59	93.5	26.5	93.3	31.5

The findings contained in Tables II and III indicate that generally speaking both the second and fifth grade subjects maintained good word recognition scores but had difficulty in comprehending what they read. This was particularly noticeable when all twenty-five second grade subjects and all twenty-five fifth grade subjects read their respective grade level material.

Each of the word recognition errors made by the subjects during oral reading was analyzed and classified according to the criteria previously described. In order to check the validity of the researcher's classifications, ten second and ten fifth grade subjects were randomly chosen from the fifty subjects. The word recognition errors made by

those subjects were analyzed and classified by one of the judges used previously in the study. The researcher's and judge's classifications showed a 99.2 percent agreement.

The frequencies of the various types of errors were then converted into percentages. Differences between the second and fifth grade subjects' proportions were tested for significancy by utilizing the Z test[5, pp. 148-149]. Those results are contained in Table IV. Probability levels of .10, .05, and .01 were reported. However, only the .01 probability was considered significant and those findings discussed.

Table IV Comparison Between the Second and Fifth Grade Subject's Word Recognition Errors

Word Recognition Errors	2nd Grade		5th Grade		%	P
	Errors	%	Errors	%	Diff	
1. Word given by examiner	190	32.2	90	15.4	17.8	<.01
2. Insertions	21	3.6	36	6.1	-2.5	<.05
3. Omissions	65	11.0	72	12.3	-1.3	>.10
4. Reverses word sequence	3	0.5	1	0.2	0.3	>.10
5. Reverses letters	0	0.0	1	0.2	-0.2	>.10
6. Reverses words	5	0.8	1	0.2	0.6	>.10
7. Overdependence on configuration	0	0.0	3	0.5	-0.5	>.10
8. Overdependence on initial clues	123	20.8	133	22.7	-1.9	>.10
9. Overdependence on final clues	6	1.0	5	0.9	0.1	>.10
10. Confusion of initial consonants	7	1.2	24	4.1	-2.9	<.01
11. Confusion of final consonants	2	0.3	7	1.2	-0.9	>.10
12. Confusion of inflectional engings	23	3.9	42	7.1	-3.2	<.05
13. Confusion of consonant clusters	23	3.9	18	3.1	-0.8	>.10
14. Confusion of hard and soft c	0	0.0	0	0.0	0.0	>.10
15. Confusion of hard and soft g	0	0.0	0	0.0	0.0	>.10
16. Confusion of short vowels	29	4.9	21	3.6	1.3	>.10
17. Nonrecognition of final e	0	0.0	4	0.7	-0.7	>.10
18. Nonrecognition of diphthongs	6	1.0	11	1.9	-0.9	>.10
19. Nonrecognition of vowel diagraphs	5	0.8	2	0.3	0.5	>.10
20. Nonrecognition or confusion of r controlled vowels or vocalic rs	2	0.3	0	0.0	0.3	>.10
21. Meaningful guesses	39	6.6	38	6.5	0.1	>.10
22. Meaningless guesses	41	6.9	77	13.1	-6.2	<.01

An inspection of Table IV revealed that the second graders seemed to have little difficulty with the various phonic skills tested during oral reading. Although they did seem to have some difficulty with short vowels, consonant clusters, and inflectional endings, the percentages were not great enough to be considered as an indication of severe difficulty. However, if they had not achieved such a high percentage of error by waiting for the examiner to tell them words, their errors might have revealed weaknesses in many phonic skills.

When the second graders did attempt a word, they seemed to rely primarily upon the initial consonant or to guess. They made almost as many meaningless guesses as they did meaningful guesses. The comparatively high percentage of omissions suggested that they may have made a conscious effort to avoid a word they could not pronounce. However, further examination of those errors suggested that they were predominantly the result of carelessness.

Further inspection of the findings revealed that the fifth grade subjects also seemed to have little difficulty with the various phonic skills tested during oral reading. There was some indication that they experienced difficulty with initial consonants, consonant clusters, and short vowels. However, even though the percentages of error were greater for those skills they were not great enough to be considered indications of extreme difficulty.

The fifth graders seemed to rely primarily upon the initial consonant or guessing as a means of coping with an unknown word and, it was surprising to note that they made a greater number of meaningless guesses than meaningful ones. The overdependence upon the initial

consonant may have also contributed to their difficulty with inflectional endings. Although they too omitted many words, further examination of errors suggested that they were primarily due to carelessness.

In comparing the types of errors made by second grade subjects with those made by fifth grade subjects, most of the differences in percentages were not statistically significant at the .01 level. The greatest difference was with the number of words given by the examiner. The lower percentage for the fifth graders may have been the result of less reluctance to attack unknown words. It is doubtful that it represents improved skill in the use of phonics because the percentage of errors for initial consonants was significantly greater. Further evidence that suggested that the fifth grader's skill in attacking words may not have been vastly improved lay in the area of meaningful and meaningless guesses. The combined percentage for those two areas nearly equaled the percentage of overdependence upon initial clues. Furthermore, there was a statistical difference at the .01 level when the meaningful guesses for fifth graders were compared to their meaningless guesses. A difference also existed when the meaningless guesses for second grade subjects were compared to those of the fifth grade subjects thus suggesting that the tendency to guess at unknown words increased with maturity particularly when it seemed that other functional phonic skills were not in the student's repertoire of word recognition skills.

In order to answer the second research hypothesis and to gain further insight into the subject's use of syntax and semantics, word recognition errors that are actual substitutions of one word for

another were analyzed using the following criteria:

1. Did the substitution fit the syntax but not the semantics of the sentence?
2. Did the substitution fit the semantics but not the syntax of the sentence?
3. Did the substitution fit both the syntax and the semantics of the sentence?
4. Did the substitution fit neither the syntax nor the semantics of the sentence?

The frequencies of the previously described substitutions were converted into percentages and differences were tested for significance using the Z test[5, pp. 148-149]. The results are contained in Table V.

Table V Comparison Between the Second and Fifth Grade Subjects' Word Recognition Substitutions

Criteria	2nd Grade Sub.	2nd Grade %	5th Grade Sub.	5th Grade %	% Diff.	P
1. Substitution fit syntax alone	212	67.1	289	74.1	7.0	<.01
2. Substitution fit semantics alone	29	9.2	6	1.5	7.7	<.01
3. Substitution fit both syntax and semantics	146	46.2	151	38.7	7.5	<.10
4. Substitution fit neither syntax nor semantics	75	23.7	95	24.4	0.7	>.10

The data in Table V indicated that fifth graders tended to make more use of syntax than second graders in substituting one word for another in oral reading. When semantics were considered alone, the second grade subjects tended to make more substitutions that agreed with the semantics of the sentence. However, when the substitutions were analyzed with respect to their agreeing with both the syntax and the semantics there was no statistical difference. Twenty-four percent of the substitutions made by either the second grade or fifth grade subjects did neither agree with the syntax nor semantics of the sentence.

On the basis of the previously discussed evidence, the first research hypothesis that second grader's word recognition errors were different from fifth graders would be accepted. However, the second research hypothesis that fifth grader's word recognition substitutions tend to fit the syntax and/or semantics of the sentence more often than those of second graders would be rejected.

Summary, Conclusions, and Implications

Within the limitations of the study the following results, conclusions, and educational implications were derived.

Results

Generally speaking, second and fifth graders made similar types of word recognition errors during oral reading. However, there were three exceptions -- (a) second graders had more words given by the

examiner, (b) fifth graders confused the initial consonant more frequently, and (c) fifth graders made more meaningless guesses.

Second graders tended to rely primarily upon three means of attacking a word. These were in order of the frequency of occurrence, (a) waiting for the word to be given by the examiner, (b) using the initial clues, and (c) guessing. The guesses were almost evenly divided between meaningful and meaningless.

Fifth graders tended to rely primarily upon three means of attacking a word. These were in the order of the frequency of occurence, (a) using the initial clues, (b) guessing, and (c) waiting for the word to be given by the examiner. They made significantly more meaningless guesses than meaningful ones.

The results related to the use of syntax and semantics indicated that the word substitutions made by second graders during oral reading tended to fit the syntax of the sentence less frequently than did those of the fifth graders. However, when semantics was considered alone, the second graders' word substitutions tended to fit the meaning of the sentence more frequently than did those of the fifth graders. The number of word substitutions that fit both the syntax and semantics of the sentence were approximately the same for second and fifth graders, and about an equal number of word substitutions made by second and fifth graders did not fit either the syntax or the semantics of the sentence. However, when the use of syntax was compared to the use of semantics, both groups tended to make more use of syntax than semantics.

Conclusions

1. Both groups tended to use the syntax and semantics of their language as a model in attempting to recognize words while reading, thereby suggesting that the language of the child serves to set expectancies that assist in word recognition.

2. Both groups tended to utilize the syntax of their language more than the semantics which possibly contributed to the consistently low scores in comprehension.

3. Both groups tended to rely primarily upon initial clues plus syntax and semantics as an aid to word recognition, and this seemed to be a successful strategy since they maintained comparatively high scores in word recognition.

4. Both groups tended to guess a great percentage of the time when attacking unknown words rather than applying word attack skills, suggesting that they had few functional phonics and structural analysis skills, or they resorted to an easier method of attack.

5. Second graders tended to be less willing to attack unknown words thereby suggesting that they possibly did not have functional phonics and structural analysis skills, or they had been conditioned to having unknown words supplied to them.

6. Fifth graders tended to make less use of semantics and made more meaningless guesses than second graders which may have reflected the more difficult level of material or less concern about reading for meaning.

Educational Implications

The following suggestions are made for classroom teachers regarding reading instruction.

1. Although the word attack strategy of utilizing the initial clues plus context (semantics and syntax) proved to be effective for both second and fifth graders, other visual clues and sound-symbol relationships should be taught to assist the student in delimiting the number of words from which he has to choose when confronted with an unknown word. Emphasis upon these skills may tend to discourage the habits of waiting for a word to be supplied or guessing.

2. Instruction in word recognition should emphasize the use of a combination of skills (cues) or a strategy rather than using one skill and disregarding all of the others. The use of context clues (semantics and syntax) should be taught in conjunction with phonics and structural analysis as an aid to and a check upon word recognition. Students should be encouraged to not only use the context clues that precede the unknown word, but also those that follow in order to set word recognition expectancies. This can be best accomplished by having them read the remainder of the sentence before applying phonic and/or structural analysis skills. Finally, they should read the word into the sentence to see if it fits the semantics. This latter step should bring about an improvement in reading for meaning.

3. The use of syntax, semantics, and the initial visual and sound clue seemed to be a natural method developed by the subjects as a word attack strategy and should not only be encouraged, but the students

should be taught to use it more effectively. Furthermore, less stress should be placed upon some phonic and structural analysis skills which are infrequently used by children in word identification while reading.

4. The use of syntax and semantics by both second and fifth graders strongly suggested that they use their language as a model with which they set expectancies while reading. Therefore, every effort should be made to extend children's language before they read to include new words and concepts that will be met in the reading material. Generally speaking, one of the major goals of instruction should be to enlarge and improve children's speaking and reading vocabularies and language structure.

5. The tendency demonstrated by both groups of subjects to guess at a word or to wait until the word was told to them suggested that more stress should be placed upon functional phonic and structural analysis skills in an actual reading situation thereby overcoming the problem of transfer from drill in isolation to functional usage.

Implications for Further Research

1. The findings from this study strongly suggested that second and fifth grade students tended to utilize the initial consonant combined with syntax and/or semantics as their major means of word attack while reading. A study using the modified cloze procedure to ascertain what percentage of unknown words students could correctly identify using those skills would be helpful in planning instruction in the word recognition skills.

2. These findings suggested that students at the second and fifth grade level tended not to use many of the phonic and structural analysis skills that they have knowledge of. A study to compare known knowledge of phonic and structural analysis skills and what is used in reading may assist in planning which phonic and structural analysis skills should be stressed in reading instructions.

3. A study designed to ascertain if students tend to alter their word attack strategy when going from easy to difficult reading material would also give some guidelines in what word recognition skills or strategies to include in the reading instructional program.

4. A study designed to ascertain the word attack strategies developed by two different groups of children -- one being subjected to a program which places a heavy stress upon phonics, and the other subjected to a program that did not place as much stress upon phonics would tend to provide insight into how functional phonics skills really are and what kind of word attack strategy children develop as a result of such training, and whether it differs from the strategy developed by children who did not receive intensive phonic training.

REFERENCES

1. Barrett's Thomas G. unpublished paper, "Taxonomy of Cognitive and Affective Dimensions of Reading Comprehension," as published in Theodore Clymer's article "Current Conceptions of Reading," Innovation and Change in Reading Instruction, Helen Robinson, Ed., The Sixty-seventh Yearbook of the National Society for the Study of Education (Chicago: University of Chicago Press, 1968), pp. 19-23.

2. Biemiller, Andrew J., "Patterns of Change in Oral Reading Errors During the First Grades," unpublished paper, Cornell University, Ithaca, N.Y., 1968. As reported in Chall's article "Research in Linguistics and Reading Instruction -- Implications for Further Research and Practice," pp. 564-565.

3. Chall, Jeanne, "Research in Linguistics and Reading Instruction -- Implications for Further Research and Practice," Reading and Realism, Figurel, J. Allen, Ed. Proceedings of the Thirteenth Annual Convention (Newark, Delaware: International Reading Association, 1969), pp. 560-571.

4. Dale, Edgar, and Chall, Jeanne S., "A Formula for Predicting Readability," Educational Research Bulletin, Ohio State Bureau of Educational Research, XXVII (January 21 and February 17, 1948), 11-20, 37-54.

5. Downie and Heath, R.W. Basic Statistical Methods, (New York: Harper and Row Publishers, 1965) pp. 148-149.

6. Spache, George D. Good Reading for Poor Readers, (Champaign: Garrard Publishing Co., 1968).

7. Weber, Rose-Marie. A Linguistic Analysis of First Grade Reading Errors, preliminary draft of research supported by a grant from the Cooperative Research Branch of the U.S. Office of Education (Ithaca, New York: Cornell University, 1967) as reported in Chall's article "Research in Linguistics and Reading Instruction -- Implications for Further Research and Practice," pp. 563-564.